

ANNUAL REPORT

1962

TOWNSHIP OF NEPEAN

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ANNUAL REPORT

ON

TOWNSHIP OF NEPEAN

SEWAGE TREATMENT PLANT

OWRC PROJECT

59-S-35;61-S-76

NEPEAN SEWAGE TREATMENT PLANT

OPERATED FOR

THE TOWNSHIP OF NEPEAN

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider

Chairman

Dr. A. E. Berry

General Manager

Mr. D. S. Caverly

Asst. General Magazine

and Director of Plant Operations

Mr. B. C. Palmer

Assistant Director,

Plant Operations Division

Mr. A. Clark

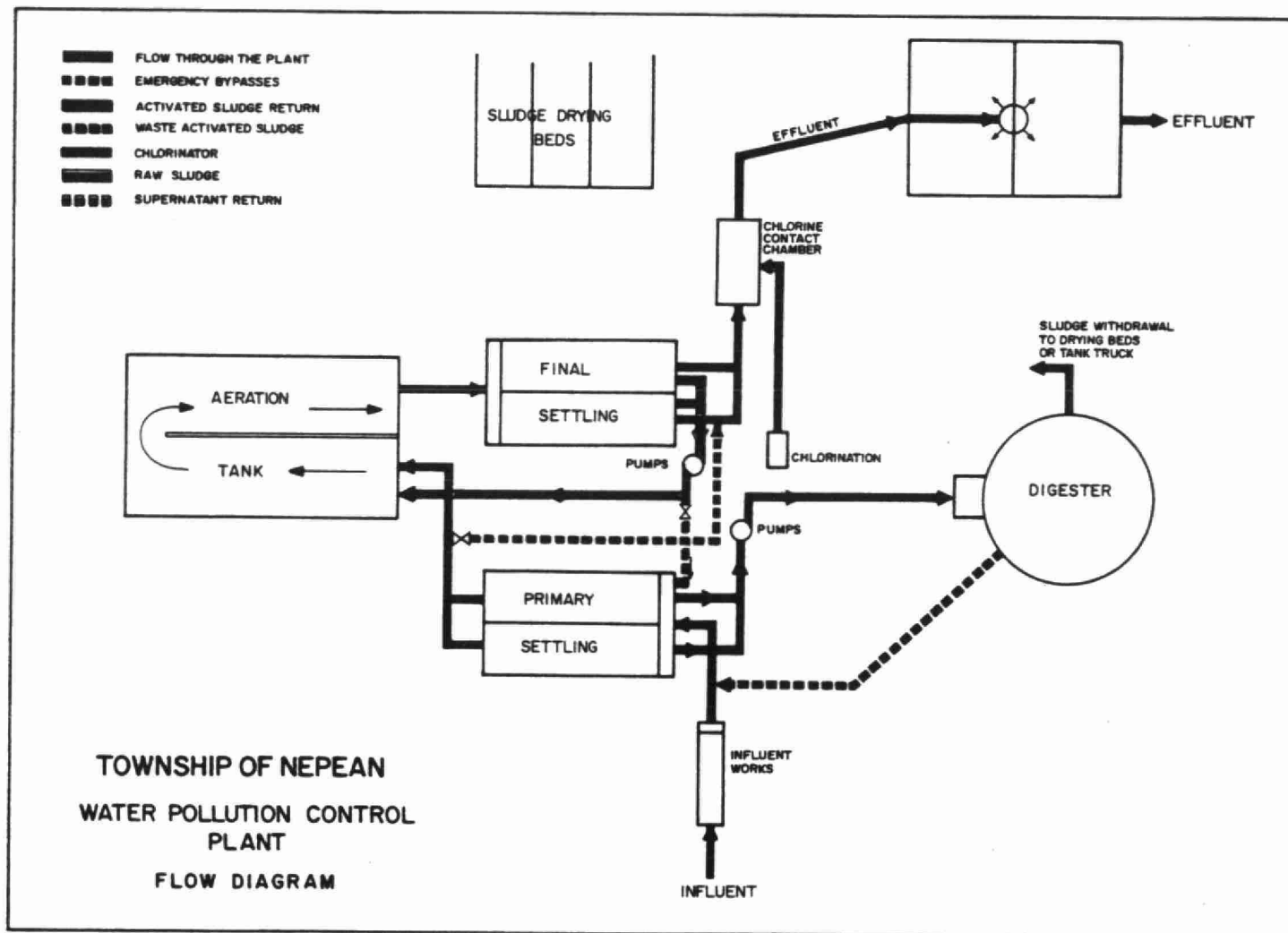
Project Engineer,

Division of Plant Operations

Prepared by the

Division of Plant Operations





TOWNSHIP OF NEPEAN SEWAGE SYSTEM

Discussions were begun early in 1958 for the design of a trunk sewer system and W.P.C.P. It was decided in April 1959 to locate the proposed plant on Watts Creek south of Hwy. #17. The Ontario Municipal Board gave tentative approval in July 1958 for design of trunk sewers and sewage treatment plant and in November 1959 J. A. Chalmers was appointed consulting engineer.

Drawings and contract documents were prepared and approved for the construction of trunk sewers and sewage pumping stations at Shirley's Bay and Woodroffe Avenue. Tenders closed on November 27th, 1959 and final O.M.B. approval was received on December 14th, 1959. The Ontario Water Resources Commission entered into an agreement with the Township of Nepean in December 1959. Less than one year later a contract was awarded for the construction of a sewage treatment plant.

While the W.P.C.P. was under construction, sewage was settled and chlorinated in a temporary tank located adjacent to the Shirley's Bay pumping station.

In the fall of 1961, this temporary tank was abandoned and sewage was directed to the W.P.C.P.

Contributions towards the cost of the project were made as follows:

Minto Construction Co., Ltd.	\$ 125,000
Merivale Developments Limited	125,000
Lynher Realty Limited	125,000
Green Glen Development Limited	125,000
National Capital Commission	<u>160,000</u>
TOTAL	\$ 660,000

PLANT DESCRIPTION

System Description

24" diameter gravity trunk collector sewer to Woodroffe Avenue sewage pumping station.

Woodroffe Avenue Sewage Pumping Station

This station has three pumps:

- a) Electric 240 GPM
- b) Electric 708 GPM
- c) Gas standby 1165 GPM

The 8" force main to 30" trunk sewer - 36" trunk sewer to Shirley's Bay.

Shirley's Bay Sewage Pumping Station

This station has three pumps - 2 electric, 2 speed pumps and 1 gas pump. These are 6-step control giving pumping capacities from 480 GPM to 2460 GPM. There is a 16" force main to the pollution control plant.

Shirley's Bay Water Pollution Control Plant

Type of Plant - Activated sludge

Design Population - 15,000

Design Plant Flow - 1.5 MGD

Inlet Sewer - 16" diameter force main from Shirley's Bay pumping station. Flow is through a coarse bar screen to one of two longitudinal grit channels, each 35'-6" long. The effluent from the grit channels flows to the two primary clarifiers.

Each tank is 60' x 15' x 8.5' bottom to W.L. giving detention at design flow of 1.55 hours.

There are longitudinal scum and sludge collectors on these tanks. Material collected is pumped to the digester by either of two plunger duplex pumps. The effluent from the primary clarifiers flows over weirs to the aeration tanks which are two in number with three cells in each. Dimensions - 2-90' x 30' x 12.5'. Aeration is by six high intensity aerating cones. Each aerator is of the vertical updraft type with sufficient capacity to turn over the entire contents of a cell in 15 minutes.

Aeration period 6.29 hours at 1.5 MGD. The effluent from the aeration tanks flows to two final settling tanks.

FINAL SETTLING TANKS

These are similar to the primary settling tanks.

Dimensions 2(60' x 15' x 8.5') and have sludge collecting mechanisms.

Sludge is pumped by either of two variable speed 850 GPM centrifugal pumps to a splitter box. The splitter box distributes the sludge to the aeration tanks (return activated sludge) and primary settling tanks (waste activated sludge). The effluent from the final settling tanks flows to the chlorine contact chamber.

CHLORINE CONTACT CHAMBER

Capacity - 15,150 gallons.

Contact time - 15 minutes approximately at 1.5 MGD.

Chlorination is by a solution fed vacuum type chlorinator.

The effluent of the contact chamber is measured by a cipolletti weir which incorporates a recording meter. The effluent is sand filtered through four sand beds each 21,000 sq. ft. before discharge to the creek.

DIGESTER

1 circular unit, 60' diameter, 21' wall depth, 59,200 cu. ft. volume.

Sludge is heated by a PFT heater with a capacity of 370,000 BTU per hour.

Heat source - digester gas or oil.

There are two sludge drying beds, each 120' x 40' with gravel beds and underdrains.

Liquid sludge may also be removed by tank truck or lagooned on site.

Pumps and heating equipment are housed in the basement of the control building. The sludge withdrawal pump is in the basement of the digester building.

OPERATIONS

Operations were begin in January 1962. Due to initial operating difficulties and equipment problems, the plant was not put into full operation until May 1962.

The digester showed signs of leaking from when it was initially filled in December 1961. Throughout the summer of 1962, the digester was emptied, repaired and tested several times and was finally made leakproof in November 1962. For a

large part of this time, raw liquid sludge was hauled away at the contractor's expense.

The collector drives on the settling tanks had to be replaced by larger units. The equipment supplier absorbed the replacement cost.

The water pollution control plant was officially opened on October 17th, 1962.

There is high infiltration into the township collector sewers which imposes a hydraulic overload on the plant and pumping stations.

At Woodroffe Avenue pumping station, the flow has been in excess of pumping capacity and the township has had to relieve the hydraulic load by employing portable pumps at other points on the sewer system. This infiltration has carried quantities of sand which has worn the moving part of the pumps thus incurring substantial repair bills.

The following visits were made by Plant Operations' staff in 1962:

Engineering inspections	11
Mechanical, maintenance	
service calls	3
Metering and control	2
L.A.C. meetings	2

LABORATORY ANALYSES

The following are raw sewage laboratory analyses and denote a weak sewage:

	<u>BOD PARTS PER MILLION</u>
Feb. 27th	38
April 27th	30
May 29th	38
June 26th	20
July 17th	70
July 31st	38 (Grab)
Sept. 4th	64
Oct. 23rd	62
Nov. 20th	39
December 11th	44

Figure 1. shows the above figures plotted in conjunction with the daily average flows for the month. The general trend is that when the flows are high the BOD's are low. This is an indication of infiltration.

The Township of Nepean is aware of this infiltration and are taking steps to rectify the situation.

OPERATING COSTS FOR 1962

<u>Costs</u>	<u>Payments in 1962</u>
Payroll	\$ 12,964.78
Fuel	1,884.97
Power	7,147.73

<u>Costs</u>	<u>Payments in 1962</u>
Chemical	\$ 3,027.31
General Supplies	1,497.82
Equipment	752.41
Maintenance and Repairs	1,128.36 (mostly at Woodroffe Ave PS)
Sundry	<u>2,734.87</u>
TOTAL	\$ 31,138.25
Budget Forecast for 1962	\$ 32,840.00

CONSTRUCTION COSTS

Contract 1

Shirley's Bay pumping station and trunk sewer from
Shirley's Bay to Bell's Corner. \$ 312,200.66

Contract 3

Woodroffe Avenue pumping station and trunk sewer
from Woodroffe Avenue to Merivale Road 318,847.92

Contract 2

Trunk sewer from Bell's Corner to Woodroffe
Avenue 184,139.02

Contract for construction of sewage treatment
plant 559,894.22

Engineering to December 1962 74,335.00

Miscellaneous equipment and pipe replacement 15,435.00

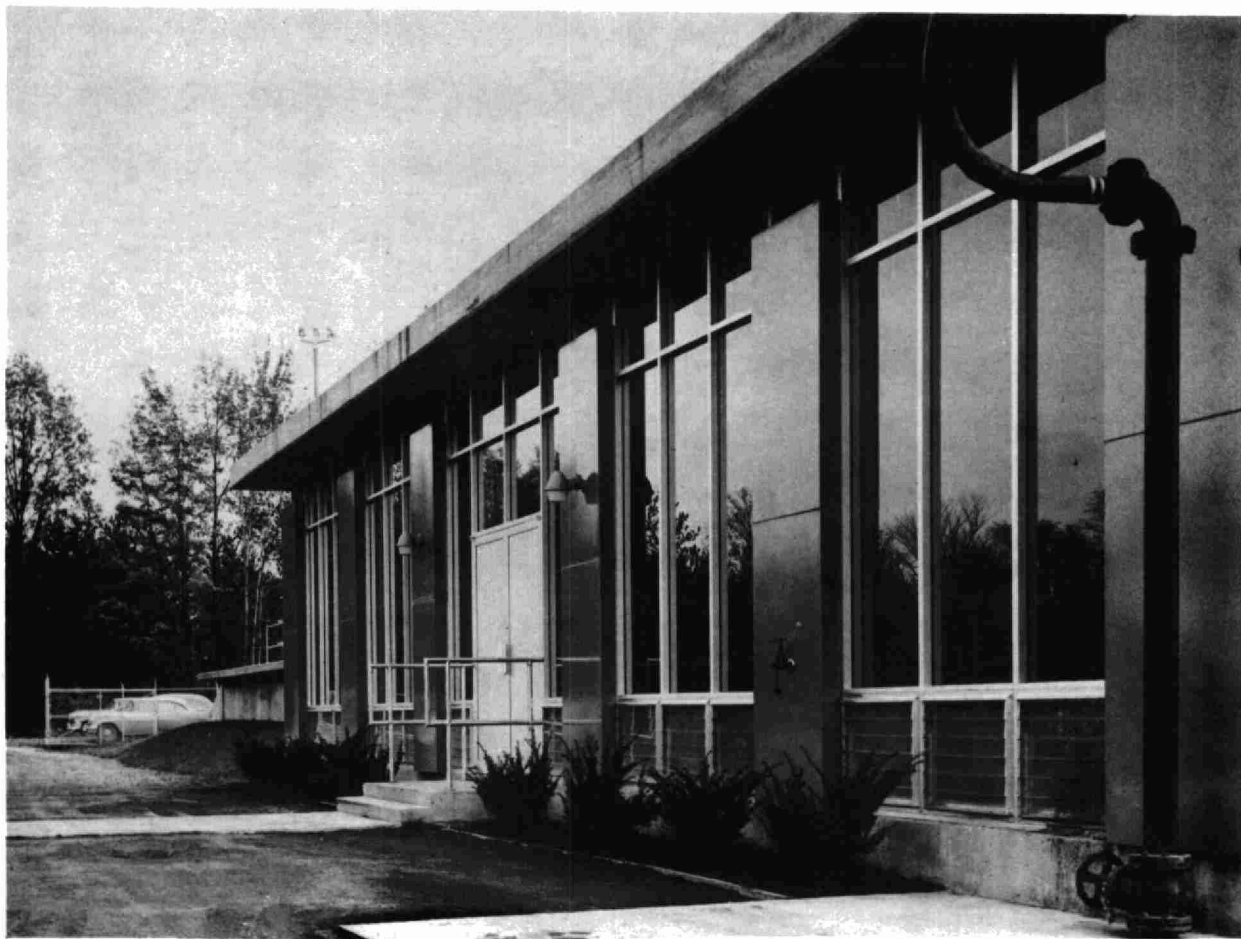
Miscellaneous costs 65,000.00

Final costs on Contract 3 have not yet been
resolved 1,529,851.82

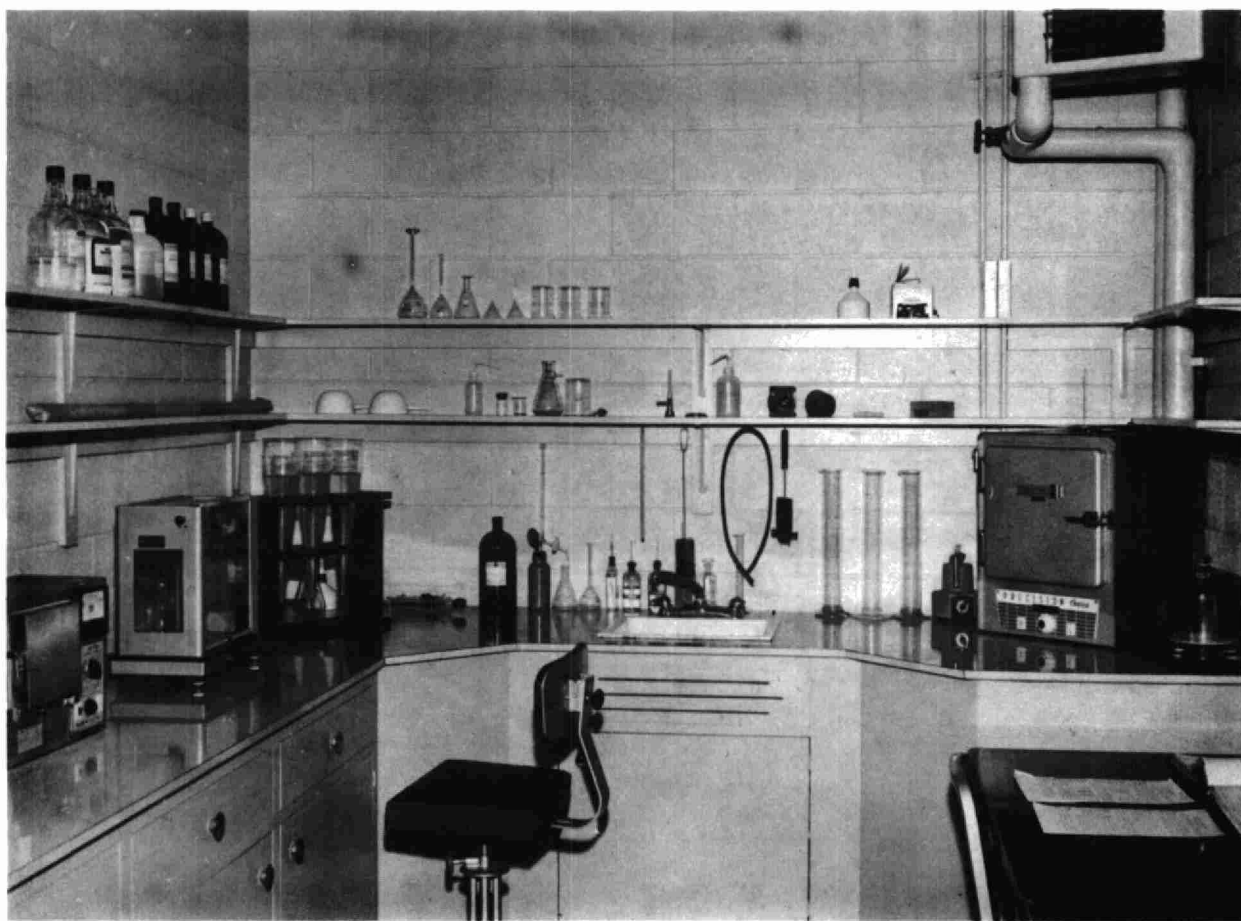
CONCLUSION

The initial operation of a plant of this type is always
difficult, but towards the end of the year the staff had become
familiar with the operation and the equipment was performing in
a satisfactory manner.

Woodroffe Avenue pumping station had severe operating pro-
blems, as previously described, and it is anticipated that these
problems will continue in 1963.



ADMINISTRATION AND CONTROL BUILDING



LABORATORY

LABORATORY LIBRARY



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